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1873/74

UNIVERSITY OF MISSOURI

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SCHOOL OF  
  
Mines and Metallurgy,

ROLLA, PHELPS CO., MO.

ANNOUNCEMENT AND REGISTER FOR YEAR ENDING  
JUNE 18th, 1874,

ST. LOUIS:

THE R. P. STUDLEY CO., PRINTERS, 221 NORTH MAIN STREET.

1874.



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## CURATORS.

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Hon. J. W. BARRETT .....	Canton.
Hon. MARTIN S. CLARDY .....	Farmington.
Hon. N. J. COLMAN .....	St. Louis.
A. J. CONANT .....	St. Louis.
Hon. JERRE C. CRAVENS .....	Springfield.
Dr. A. M. DOCKERY .....	Gallatin.
W. T. ESSEX, Esq. ....	Kirkwood.
Hon. H. CLAY EWING .....	Jefferson City.
Hon. JOHN W. HARRIS .....	Boone Co.
Hon. PAUL HUBBARD .....	Columbia.
Rev. C. P. JONES, D.D. ....	Marshfield.
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Dr. WALTER T. LENOIR .....	Columbia.
Hon. HENRY T. MUDD .....	Kirkwood.
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Hon. JAMES S. ROLLINS .....	Columbia.
WM. STARKE, Esq. ....	Louisiana.
Hon. HENRY SMITH .....	Liberty.
EDWIN W. STEPHENS, Esq. ....	Columbia.
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Hon. SQUIRE TURNER .....	Columbia.
Hon. JOHN F. WIELANDY .....	Jefferson City.
Hon. SAMUEL G. WILLIAMS .....	Rolla.
Hon. EDWARD WYMAN .....	St. Louis.

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## Executive Committee School of Mines.

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Hon. ELIJAH PERRY,	Hon. SAM'L G. WILLIAMS,
<i>Chairman.</i>	<i>Secretary.</i>
A. J. CONANT, Esq.	Rev. C. P. JONES.
ALEX. DEMUTH, Esq.,	<i>Treasurer,</i>
ROLLA.	

# SCHOOL OF MINES.

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## Faculty and Officers.

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DANIEL READ, LL.D.,  
*President.*

CHAS. P. WILLIAMS, Ph. D.,  
*Director and Professor of Analytical Chemistry and Metallurgy.*

Col. JAS. W. ABERT, A.M.,  
*Professor of Applied Mathematics and Graphics.*

NELSON W. ALLEN, A.B.,  
*Professor of Pure Mathematics.*

GEO. D. EMERSON, M.E.,  
*Professor of Civil and Mine Engineering.*

R. W. DOUTHAT, A.M.,  
*Professor of English Branches.*

WM. E. GLENN, M.D.,  
*Lecturer on Anatomy, Physiology, etc.*

N. W. ALLEN,  
*Secretary of the Faculty.*

# LIST OF STUDENTS.

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## THIRD YEAR.

Duncan, Gustavus A. ....	Ozark Iron Works.	
Gill, John Holt .....	Rolla.	
Pack, John Wallace .....	"	— 3

## SECOND YEAR.

Amsden, Otto B. ....	Cuba.	
Deegan, Francis J. ....	Rolla.	
Hare, Almon W. ....	"	
Taylor, Edward C. ....	"	
Winters, Christian R. ....	"	— 5

## FIRST YEAR.

Allen, Frank D. ....	Allenton.	
Bumpass, Oliver P. ....	Weldon.	
Downer, Richard A. ....	DeSoto.	
Emerson, Cyrus G. ....	Rolla.	
Garvens, Oscar E. ....	"	
Gerrish, David A. ....	"	
Goggin, Charles S. ....	Flatwood.	
Hambleton, Wallace .....	Rolla.	
Hatch, Osias M. ....	"	
Hatch, Arthur G. ....	"	
Jolly, Edward J. ....	Meramec Iron Works.	
McGrath, John E. ....	St. Louis.	
Minger, William C. ....	Vienna.	
Pierce, James W. ....	Holden.	
Storts, Jefferson .....	Rolla.	
Toomey, Joseph L. ....	"	—16

## SPECIAL.

Baker, Eva—Physiology. ....	Rolla.	
Baker, Flora—Drawing .....	"	
Bishop, Jennie—Physiology, etc. ....	"	
Bishop, Julia—Physiology .....	"	
Blow, Peter E.—Anal. Chem. ....	St. Louis.	
Beddoe, Mary—Anat., Phys., etc. ....	Rolla.	
Dorey, Joseph T.—Civil Engin. ....	Lebanon, Ill.	
Falls, Emma—Draw. & Engl. ....	Rolla.	

Harrison, John P.—Math. & Surv. ....	Arlington.
Hooker, Lena—Math., Draw. & Engl. ....	Lebanon.
Hoskinson, Fannie—Math., Draw., Ger. & Engl. ....	Rolla.
Hutcheson, Mary E.—Mathematics.....	“
Hume, Annie—Physiology, etc. ....	“
Livesay, John S.—Anal. Chem. ....	“
Love, Carrie—Draw. & Engl. ....	“
Meagher, Michael M.—Civ. Engin. ....	St. Louis.
Mitchell, Charles T.—Assaying.....	Elizabeth, N. J.
Minium, Sarah—Physiology ....	Rolla.
Nivin, Lillie—Physiology ....	“
Pack, Edward—Physiology ....	“
Partridge, Mary—Physiology ....	“
Richardson, George H.—Civ. Engin.....	“
Scherpe, Annie—Draw. & Ger. ....	“
Seay, Missouri E.—Draw., Engl. & Ger.....	Steeleville.
Shaw, Lola J.—Draw., Engl. & Ger. ....	Rolla.
Van Wormer, Mary—Physiology.....	“
Whiting, Florence E.—Mathematics.....	“
Webb, Ellen—Physiology ....	“
Winters, Charles—Physiology ....	“

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## PREPARATORY.

Alter, William H. ....	Meramec Iron Works.
Auerbach, Louis ....	Rolla.
Blanchard, Eliphalet.....	Steeleville.
Brene, Gustavus P. ....	Dillon.
Campbell, Valerius W. ....	Linn.
Duncan, William S. ....	Ozark Iron Works.
Dyer, James L. ....	Rolla.
Falls, Sarah ....	“
Faulkner, Charles W. ....	“
Fetzer, Fred. W. ....	“
Finn, Richard H. ....	Arlington.
Followay, John ....	Rolla.
Gibson, Samuel C. ....	Steeleville.
Gibson, Samuel L. ....	Wetglaze.
Griffith, James L. ....	Meramec Iron Works.
Guild, Frank D. ....	Rolla.
Harrison, James B. ....	Lebanon.
Harrison, Laura B. ....	Arlington.
Harvey, John H. ....	Kirkwood.
Hawkins, Robert F. ....	Flatwood.
Hill, Ada.....	Waynesville.
Hoskinson, William B. ....	Rolla.
Hutcheson, John C. ....	Lane's Prairie.
Hutcheson, Sarah E. ....	Rolla.
Hutcheson William M. ....	Gallaway Station.
Johnson, J. Larkin ....	Waynesville.
Lightner, Mahlon T. ....	Huntingdon Co., Pa.

Love, George L. ....	Rolla.
McKnight, James D. ....	Dauphine.
Myers, Charles. ....	Carthage.
Myers, William N. ....	"
Mills, Joseph. ....	Rolla.
Millsaps, Thomas H. ....	Steeleville.
Obrien, John T. ....	Rolla.
Pack, James A. ....	"
Pierce, Charles M. ....	Holden.
Powell, Joseph C. ....	Labadie.
Prigmore, Taylor. ....	Rolla.
Richardson, William H. ....	St. Louis.
Richardson, Harry R. ....	"
Robinson, Virgil A. S. ....	Waynesville.
Scott, Homer E. ....	Rolla.
Scott, Annie. ....	"
Shuttee, Henry C. ....	West Plains.
Smith, Ex. ....	Rolla.
Smith, Ida. ....	"
Snelson, William H. ....	Meramec Iron Works.
Starr, Jonas. ....	Licking.
Storts, Charles B. ....	Rolla.
Sutherland, Frank. ....	Kirkwood.
Thiele, Louis W. ....	St. Louis.
Watkins, J. D. . ....	Dent county.
Weber, Americus C. ....	Rolla.
Wilson, Frederick W. ....	"

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## RECAPITULATION.

Third Year Class .....	3
Second " " .....	5
First " " .....	16
Special and Partial Students .....	29
Preparatory Students .....	54
Total.....	107



# Course of Study.

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## PREPARATORY.

### *First Semester.*

Algebra—to Quadratic Equations (Loomis) ; Metrical System.  
Rhetoric and Composition (Hart) ; Word Analysis (Swinton).  
Physical Geography (Guyot) ; Physics (Ganot).  
Drawing—Freehand and Ornamental.

### *Second Semester.*

Algebra (Loomis)—finished.  
English Literature (Hart) ; Logic (Coppée).  
Chemistry (Elliott & Storer's Manual).  
Botany—Structural and Systematic (Gray).  
Drawing—Freehand and Ornamental.  
During the entire year—bi-weekly Exercises in Declamation and Themes.

## FIRST YEAR.

### *First Semester.*

Geometry—(Davies' Legendre).  
Chemical Philosophy (Cooke) ; General Chemistry (Lectures).  
Analytical Chemistry—Blow-pipe Analysis (Elderhorst).  
Mineralogy—Descriptive (Dana).  
Physics (Lectures) ; Drawing—Mechanical.  
During the semester—Exercises in Declamation and Themes.

### *Second Semester.*

Trigonometry (Loomis) ; Mensuration (Vogdes).  
Land Surveying (Gillespie), with Field Practice.  
General and Industrial Chemistry—Lectures.  
Mineralogy—Determinative (Laboratory).  
Physics (Lectures) ; Drawing—Mechanical.

## SECOND YEAR.

*First Semester.*

## I.—(FOR ALL COURSES.)

Analytical Geometry (Loomis) ; Descriptive Geometry (Davies).  
 Higher Surveying (Gillespie), with Field Practice.  
 Geology—Dynamical and Historical (Lectures).  
 Drawing—Mechanical.

## II.—(FOR CIVIL ENGINEERING COURSE.)

Roads and Railroads (Gillespie).  
 Analytical Chemistry—Qualitative (Fresenius)—optional.

## III.—(FOR MINE ENGINEERING COURSE.)

Mine Engineering—Systems of Attack, etc. (Lectures).  
 Metallurgy—Iron, Zinc, Copper (Lectures).  
 Analytical Chemistry—Qualitative (Fresenius).

## IV.—(FOR COURSE IN PHILOSOPHY.)

Course of No. I. and III., omitting Lectures on Mine Engineering.

*Second Semester.*

## I.—(FOR ALL COURSES.)

Calculus (Loomis) ; Shades, Shadows, and Perspective (Davies).  
 Geology—Dynamical and Historical (Lectures).  
 Drawing—Mechanical.

## II.—(FOR CIVIL ENGINEERING COURSE.)

Civil Engineering (Mahan) and Lectures.  
 Analytical Chemistry—Quantitative (optional).

## III.—(FOR MINE ENGINEERING COURSE.)

Mine Engineering (Lectures).  
 Metallurgy—Lead, Silver, and Mercury (Lectures).  
 Analytical Chemistry—Quantitative (Fresenius).

## IV.—(COURSE IN PHILOSOPHY.)

No. I. and No. III., omitting Lectures on Mine Engineering.

## THIRD YEAR.

*First Semester.*

## I.—(FOR ALL COURSES.)

Analytical Mechanics ; Stone Cutting (Mahan).  
 Elements of Mechanism (Goodeve).  
 Drawing—Mechanical.

## II.—(FOR CIVIL ENGINEERING COURSE.)

Civil Engineering (Mahan and Lectures).

## III.—(FOR MINE ENGINEERING.)

Mine Engineering (Lectures).

Metallurgy—Gold, Tin, Bismuth, and Antimony (Lectures).

Applied Geology—Veins and Vein Phenomena.

Analytical Chemistry—Quantitative and Assaying.

## IV.—(FOR COURSE IN PHILOSOPHY.)

Nos. I. and III., omitting Lectures on Mine Engineering and Applied Geology.

*Second Semester.*

## I.—(FOR ALL COURSES.)

Applied Mechanics ; Machinery and Motors.

Graduation Theses.

## II.—(FOR CIVIL ENGINEERING COURSE.)

Civil Engineering (Mahan and Lectures).

## III.—(FOR MINE ENGINEERING COURSE.)

Mine Engineering—Lectures.

Analytical Chemistry—Quantitative and Assaying.

## IV.—(FOR COURSE IN PHILOSOPHY.)

Nos. I. and III., omitting Lectures on Mine Engineering.

French and German are optional studies during all the years excepting the preparatory. In the preparatory year Latin is made an optional study.

For the convenience of those not desirous of taking the full professional course, a second or supplemental year will be added to the Preparatory Department, in which further attention will be given to the English branches and fuller opportunities be afforded for the study of Latin. This course will be developed and arranged by the opening of the next collegiate year, and will constitute with the year in the preparatory proper, above given, a two years' English course. The studies will take the place of those of the first year of the Technical schools, and will be for the benefit of those whose means, time or inclination will not permit of a fuller attendance upon the regular lines of instruction of the institution.

An evening course of lectures on Anatomy, Physiology, and Hygiene, is delivered during the winter semester, and is open to all

students. It is well illustrated by preparations, diagrams, and the oxy-hydrogen lantern. Arrangements will also be perfected for a winter's course of lectures on subjects of general interest, or on special departments of Science.

## Synopsis of Departments of Instruction.

### MATHEMATICS—PURE AND APPLIED.

Professors ALLEN and ABERT.

PREPARATORY YEAR.—Algebra (Loomis).

FIRST YEAR.—Geometry (Davies' Legendre); Trigonometry (Loomis); *Mensuration\** (Vogdes).

SECOND YEAR.—Analytical Geometry (Loomis); Calculus (Loomis); *Descriptive Geometry* (Davies); *Shades, Shadows, and Perspective* (Davies).

THIRD YEAR.—Mechanics (Peck); *Stereotomy and Stone Cutting* (Mahan).

### ANALYTICAL CHEMISTRY.

CHARLES P. WILLIAMS, Ph.D., Professor.

FIRST YEAR.—Blow-pipe Analysis (Elderhorst Manual); Qualitative Analysis (Fresenius).

SECOND YEAR.—Qualitative Analysis (Fresenius); Quantitative Analysis (Fresenius).

THIRD YEAR.—Quantitative Analysis (Fresenius); Assaying.

The Quantitative Course includes analyses, either partial or complete, of the following series, each estimation being, at least, duplicated:†

(1) *Zinc Sulphate*; (2) *Barium Chloride*; (3) *Alum*; (4) *Chrome Alum*; (5) *Sulphate of Iron and Ammonia*; (6) *Blue Vitriol*; (7) *Calcite*; (8) *Calamine*; (9) *Galena*; (10) *Chalcopyrite*; (11) *Orthoclase*; (12) *Kaolin*; (13) *Hematite*; (14) *Pyrolusite*, and *Chlorine valuation*; (15) *Soda Ash, valuation*; (16) *Bleaching Powder, valuation*; (17) *Cerussite*; (18) *Smithsonite*; (19) *Blende*;

\* Recitations of this department printed in italics are under charge of Prof. Abert; those in ordinary type are conducted by Prof. Allen.

† Those in italics are *partial analyses*.

(20) Coal, proximate ; (21) Coal ; ultimate and heating power ; (22) Blast-furnace Slag ; (23) Lead-furnace Slag ; (24) Stibnite ; (25) Realgar ; (26) Pig Iron ; (27) Fahlerz ; (28) Commercial Lead ; (29) Spelter ; (30) Native Bismuth ; (31) Kupfer-Nickel ; (32) Beryl ; (33) Zircon ; (34) Illmenite ; (35) Chromite ; (36) Saltpetre Soil ; (37) Mineral Water.

Besides this course, there is the usual practice in the fire assay of the ores of Lead and Silver, of argentiferous and auriferous native compounds and artificial products, and in the docimastic valuation of the ores of the most prominent metals.

## METALLURGY.

Prof. WILLIAMS.

The instruction in this department is given by lectures, supplemented by laboratory practice (omitting Nos. 14, 15, 16, 32, 33, 36 and 37 of the list given under Analytical Chemistry), and is illustrated by diagrams, models, and specimens. The course is introduced by Iron, and is followed by Zinc, Lead, Silver, Nickel, Mercury, Copper, Gold, and Antimony. The principles of furnace construction, of slag formation, and of general metallurgical operations, are discussed throughout the course, and special illustrations are given of all the methods described. The students are required to solve problems involving the discussion of the desirable method of treatment of ores of stated composition under given economical conditions, and to accompany the solutions with plans and estimates for works to carry out the method. In the lectures and other exercises of this department, full cognizance is taken of the peculiar economic conditions surrounding metallurgical industry in this country, and especial reference is had to the staple metallic products of Missouri—Iron, Lead, and Zinc. Studies are made of the local Iron establishments, and excursions are made to other Iron works, as well as to those at which Lead and Zinc ores are practically treated.

## PHYSICS.

....., Professor.

[At present this department is but partially organized, the instruction in it being given by the Director and Professors Allen and Emerson. Excellent and complete apparatus for demonstration has already been purchased, and efforts will be made to give more definite shape to the department by the opening of the new collegiate year.]



## GEOLOGY AND MINERALOGY.

In the preparatory year, the students have recitations and lectures in Physical Geography; in the first year, recitations and lectures in Descriptive Mineralogy, and Laboratory exercises in the determination of a series of fifty-five well selected mineral species, with special reference to the ores of the metals and their associated gangues. These exercises are followed, in the second year, by lectures and recitations (based on Dana's Manual) on Dynamical and Historical Geology. The lectures on Lithology, and on Mineral Veins, and Ore Deposits, together with an account of the chief Geological features of and modes of occurrence in the principal Mining Districts, completes the course.

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## CIVIL ENGINEERING.

Prof. EMERSON.

Besides the recitations and lectures, the practical work in the field forms a prominent feature of the method of instruction in this department. The use of instruments in the field by all the students of Civil Engineering begins with the second semester of the first year and is continued throughout the course. Friday and Saturday of each week are devoted to this exercise, and, where necessary, longer time is taken for excursions to the mines, furnaces, bridges, railroad constructions, etc., of the country. The field practice consists of Land Surveying by all the methods in use, or described in the books. Railway curves are calculated and set out upon the ground; earth-work is measured and estimated from the embankments and excavations of the railroad; contours of the adjacent country are made and platted, and the student is made practically familiar with the manipulation of all instruments in common use. A general system of triangulation of the country about Rolla is begun from a base line carefully laid by the students, and will be extended from time to time for their instruction. The course is parallel with those of the Pure and Applied Mathematics, and is supplemented by that of

## GRAPHICS.

Col. J. W. ABERT, Professor.

During the preparatory year the students are instructed in the elements of Drawing with pencil and pen, according to the principles contained in Chapman's Drawing-Book. They are also practised in Free-hand Drawing. These exercises develop the special tenden-

cies of the pupil and enable the Professor to judge in what direction his greatest strength lies, and where his weak points most need to be reinforced.

During the first year the practice is in Topographical Drawing with pen and India ink, representing the lines of contour of the earth's surface, showing the bounding curves which would limit the surface in case of a gradual rise of water taken at every 5, 10 or  $x$  feet. The hatching lines of declivity are drawn; also the various conventional representations of surface. The students are exercised in a carefully organized method of drill in printing, in order to acquire a rapid system of lettering, of essential importance in finishing maps, problems, title pages, and mechanical drawings. There is also a careful study of the true standards of the three colors, with their secondary and ternary combinations, simultaneous contrasts, harmonies, unisons, aerial perspective, and the important practical application of laying on flat tints. This is followed by applications to colored topography, etc.

The second year's exercises are in construction of problems in Descriptive Geometry, and in Shades, Shadows and Perspective. The problems are drawn with pen and India ink on "demi" drawing paper, and are all constructed on mathematical principles, displaying all the difficult problems of the intersection of curved surfaces, and the representations of warped surfaces having two or three directrices.

In the third year the subject of Stereotomy is taken up in its application to the various problems of stone-cutting, and the construction of terre-pleins, ramparts, ramps, and embrasures of permanent fortifications. There are also required Drawings of bridges, furnaces, machines, their shadows and perspective, as they would appear to the eye at a finite distance from the perspective plane, mathematically constructed and properly colored.

Those who possess the requisite taste for such subjects may be exercised in pen, India ink and color Drawings of landscapes, figures, etc., and be led to apply their acquirements to Natural History.

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## MINE ENGINEERING.

Prof. EMERSON.

This is taught entirely by lectures. The subjects of systems of attack of mineral deposits; of shafts, adits, and levels; timbering, subterranean transportation; hoisting, pumping; surface transportation, and mechanical concentration, are properly considered. The

course is fully supplemented by the field practice, the civil engineering course, and by instruction in drawing plans and sections of underground workings.

## (PREPARATORY) DEPARTMENT OF ENGLISH.

Prof. DOUTHAT.

*First Semester.* — The students have daily recitations in (Swinton's) Word Analysis until the book is finished and has been reviewed. The subject of Rhetoric (with Hart's Manual as the text book) is then taken up, completed, and reviewed. Arithmetic, with special reference to the metrical system, is also reviewed.

Exercises in Composition and Declamation are given a prominent place in this as well as in the second semester of the year. The exercises take place every Saturday morning, and are superintended by Prof. Douthat, with Professors Abert and Allen as critics.

The studies of the first semester are continued through the second semester for the benefit of those found unprepared, on examination, to enter upon the studies of the second term proper. This arrangement also accommodates those who have been unable to present themselves for admission at the beginning of the collegiate year, affording opportunity for review of useful English studies before entering upon the duties of the school proper.

The English studies of the second semester of the preparatory year comprehend English Literature and Logic, more time being given during this term to preparatory work in Chemistry and in Natural History. As elsewhere stated, it is designed to add to the Preparatory Department a second year's course, in which fuller attention will be given to the English studies. This arrangement will assist a very considerable class which desires the benefits of the school in this direction and which is not interested in the studies of the school proper.

## FEES, EXPENSES, ETC.

The fees for instruction, etc., at the School of Mines and Metallurgy are the same as at the other departments of the University, viz.: An annual entrance fee of \$10, besides an assessment of \$5 per semester for incidentals and for the use of the library. Special and partial students are subject to the same charges; an exception, however, being made against those devoting their entire time to Analytical Chemistry or Assaying. Such pay a small additional fee for



chemicals consumed. All laboratory students furnish their own blow-pipes, platinum crucibles and apparatus, silver and gold solutions, alcohol for heating purposes, and pay for apparatus damaged or broken while in their service.

The exercises of the Drawing-room require also a small expenditure, annually, for materials. Text books and all requisite materials for students can be procured in Rolla, either from dealers, or, in the case of chemical apparatus, from the school, at the usual rates.

A fee of \$5 must be paid, before graduation, for the diploma, and a fee of \$1 for the certificate of proficiency.

The courses of study will be rigidly enforced on all students candidates for the degrees of the institution. The professional degrees awarded are Civil Engineer (C.E.), Mine Engineer (M.E.), or Bachelor of Philosophy (Ph.B.) Students not candidates for degrees, or special students, are admitted at any time, and are allowed the fullest liberty in the selection of their studies, provided always that such shall have at least sixteen recitations, weekly. To these classes of students certificates of proficiency are issued on satisfactory examination being passed. These certificates are issued with the diplomas only at the public commencements.

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## ADMISSION.

For the Preparatory Department applicants must be at least sixteen years of age, and must stand an examination in the ordinary branches of an English Education. For admission to First Year studies, students must be at least seventeen years of age, and must stand an examination in all the regular studies of the Preparatory Year.

Special students, in any department, are admitted without previous examination.

Before matriculation and entrance upon the duties of the school, the Treasurer's receipt for entrance fee and for the incidentals of the semester must be shown to the Director, and a card, properly endorsed, be procured from him. The Secretary of the Faculty will then place the student's name upon the roll and furnish him with all necessary information.

An examination for admission will be held on Tuesday and Wednesday, the 8th and 9th days of September. The collegiate year begins Thursday, September 10th. There is no suspension of exercises — other than for examination — between the two semesters of the year.

Excellent Boarding, at places approved by the Faculty, can be obtained at from \$3.50 to \$4 per week. A list of such places can be seen on application to the Secretary. The expenses for board may be reduced somewhat by a judicious system of clubbing in rented rooms. The school has no dormitories under its control.

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### HISTORICAL, ETC.

The school of Mines and Metallurgy—a department of the University of the State of Missouri—is located at Rolla, Phelps County, on the line of the Atlantic and Pacific Railroad, one hundred and thirteen miles southwesterly from St. Louis. The locality is preëminently healthy, and is in the midst of an extensive and rapidly developing iron section, with districts abounding in lead and zinc deposits within easy access. Good opportunities are thus afforded for the field study of some of the occurrences of the ores of these metals, and for the practical study of their modes of treatment. Excursions for such purposes will constitute a prominent feature in the instruction of the advanced classes.

The institution was created by the legislative act of February, 1870, disposing of the congressional grant of land for agricultural and mechanical colleges. It was formally opened November 23d, 1871, and is therefore just closing the third year of its history. It is designed, in connection with the Agricultural College of the University, to carry out to its amplest extent the intention of the Act of Congress providing for education in the industrial arts. Its curriculum has therefore been arranged with that prominently in view, and effort has been made to furnish ample facilities for thorough instruction in the sciences and in their industrial applications. It is a school of Technology, with Civil and Mining Engineering and Metallurgy as specialties.

The apparatus, instruments and other appliances already possessed by the School are very complete and of the best approved forms. Among these are excellent surveying and engineering instruments; physical apparatus, embodying the newest forms for illustration and research; together with models for engineering, topographical and ornamental drawing. The geological, mineralogical and technical collections are rapidly increasing, by both donation and purchase. Under the Act creating the Geological Survey of the State, this School is the depository of one of the three suites of specimens collected during the progress of the survey. Already a number of excellent and characteristic specimens from domestic

localities have been received from that source. The laboratories for analysis and for assaying are well furnished with working tables and with apparatus and reagents necessary for practical instruction and for any line of research.

The library has been selected with special reference to supplementing the labors of the class and lecture rooms, and consists, therefore, largely of standard reference works on the physical sciences, mathematics and technology. A good selection of technical periodicals is supplied to the reading room, and strong efforts will be made to keep the collection of these and of the books up to the progress of the several departments. The same may be safely promised for the apparatus, collections, models and other adjuncts to the proper working of a school of this character.

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### DONATIONS.

Acknowledgments are due to the following named for donations to the library and the collections of the School :

Hon. Henry T. Blow, for a suite of ores and products from the mines and works of the Granby Mining and Smelting Company.

The Lehigh Zinc Company, of Pennsylvania, through Gordon Monges, Treasurer; a suite of ores and products illustrative of spelter and oxide production; accompanied by a full-sized retort and receiver.

Pennsylvania Salt Company, through Geo. T. Lewis, Esq., of Philadelphia, cryolite and associated minerals and series of products from cryolite.

W. McGinnis, Esq., editor of *La Revista Republicana*, Albuquerque, New Mexico, miscellaneous ores and coals from New Mexico and Colorado.

Messrs. Moffett & Sergeant, of Joplin, Mo., Stibnite and associated minerals from Sevier county, Arkansas.

Missouri Zinc Company, specimens of Spelter and roasted ore employed in its manufacture.

St. Louis Stoneware Company, by W. W. Stickney, Esq., President, specimens of Fire Clay, Brick and Tile.

Prof. Geo. D. Emerson, large specimen of native Silver from Keweenaw Point, Lake Superior.

T. A. Buckland, Esq., large geode with crystals of Amethystine Quartz, from Buckland's Bank, Phelps county.

Dr. Thos. M. Drown, Secretary American Institute Mining Engineers, 1st vol. of Transactions.

Secretary American Iron and Steel Association, Proceedings of Meetings.

To the Hon. Thos. C. Harrison, for valuable State Documents, including the Report of the Geological Survey; to Senator Schurz, and Representatives Finkelnberg and Bland, for important Geological and other publications from Washington; and to the Hon. Commissioner of Patents for copy of Weekly Official Gazette of Patent Office.

Acknowledgments must be made in this connection to A. A. Talmage, Esq., Superintendent of the Atlantic and Pacific Railroad, and to J. S. Blanchard, Esq., General Manager of the Salem and Little Rock Railroad, for generous favors to the students and officers of the School in their field excursions. Many courtesies have also been extended to the institution by the managers of mines and furnaces both in this vicinity and in St. Louis.

## Calendar.

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1874.

September 10, Thursday ..... Winter Semester begins.

December 19, Saturday..... Close for Christmas Holidays.

1875.

January 4, Monday..... Exercises resumed.

February 1, Monday ..... Half-yearly Examination begins.

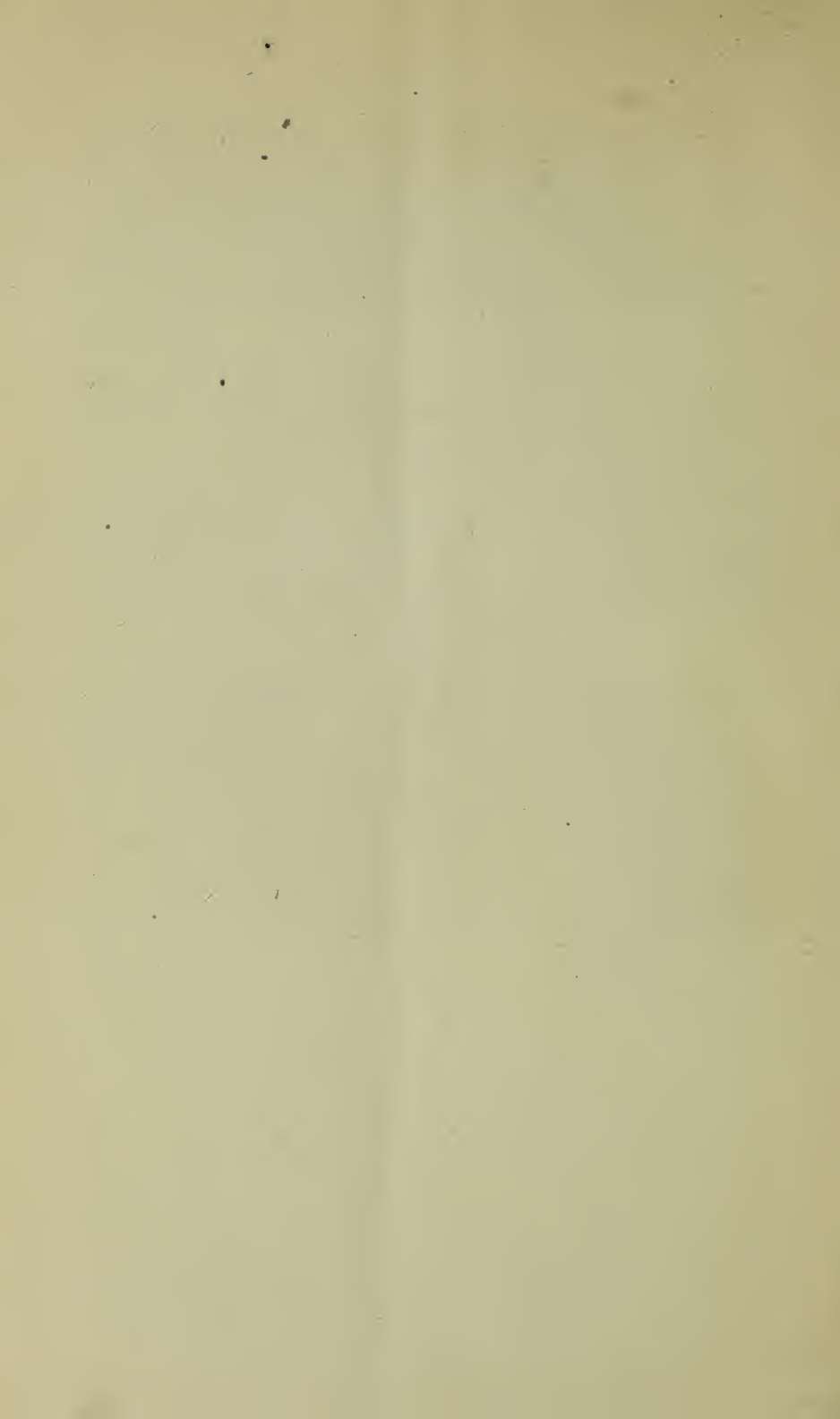
February 6, Saturday. .... Half-yearly Examination closes.

February 8, Monday,..... Summer Semester begins.

June 7, Monday..... Yearly Examination begins.

June 15, Tuesday..... Yearly Examination closes.

June 17, Thursday..... Annual Commencement.









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